

**Dr. H. F. Parsons's Report to the Local Government Board
on the prevalence of "Fever" in the Enfield Urban
District, and on the general Sanitary Condition of the
District.**

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The Urban Sanitary District of Enfield, co-extensive with the parish of the same name, is situated in the north-eastern corner of Middlesex, between the counties of Herts on the north and again on the south-west, and Essex on the east, from the latter of which it is separated by the old channel of the River Lea. For registration purposes the same area constitutes the Enfield sub-district of the Edmonton Registration District. It is included by the Registrar-General in his "Outer Ring" of London. The population was in 1871 16,054, having been 12,424 in 1861; at the same rate of increase it would amount at the present time to 20,220. Local estimates place it as high as 24,000, but it does not appear that these estimates rest on any ascertained facts. The number of inhabited houses on March 25th, 1880, was 3,400; reckoning 5.5 persons to each inhabited house—the proportion found at the last census—these would contain a population of 18,700, but owing to the large influx of persons of the labouring class and the frequency of sub-letting, it is probable that the average proportion of inmates to each house is greater now than in 1871. The number of inhabited houses in 1871 was 2,893, the number of families or separate occupiers 3,515.

Topography.—The Enfield district is an extensive one, having an area of 12,653 acres, and reaching eight miles in length from east to west, and three miles from north to south. I shall describe it as consisting of three portions.

I. The western portion of the district, comprising about half its area, is purely agricultural, pasture, and woodland. In olden times it formed a portion of the royal forest of Enfield Chase, which was disafforested in 1803. The surface is very undulating, the hills rising to a height of 300 to 400 feet above the sea. A watershed called the Ridgeway, along which the road from Enfield to Potter's Bar runs, traverses it from S.E. to N.W. The tract S.W. of this ridge is drained by Salmon's Brook, that to the N.E. by the Turkey Street Brook, both tributaries of the Lea. Geologically this portion of the district is composed of London clay, capped on the summits of the hills with patches of glacial gravel and boulder clay. With the exception of an outlying area at the extreme west on which some 30 or 40 houses, forming part of Hadley village, are situated, this portion of the district has a scanty and scattered population, dwelling in isolated mansions, farmhouses, and cottages. There is no public water supply and no sewerage, except that a tank has been constructed to receive the drainage of the houses at Hadley. Cesspit privies are the chief means for the disposal of excrement.

II. The central portion of the district contains the old town of Enfield. From this two parallel streets, Chase Side and Baker Street, run northwards, and are connected by a few transverse lanes. Brigadier Hill, Clay Hill, and

Forty Hill are outlying hamlets to the north. This portion of the district, which for convenience I shall call "Central Enfield," lies between the 100 and 200 feet contour lines, having a general and somewhat regular slope to the S.E. The geological formation is partly London clay, partly the overlying gravels. The inhabitants of Central Enfield belong to the professional, commercial, and artizan classes, and many of them are employed during the day in London. The houses for the most part are not built in continuous rows, but are scattered irregularly, and stand alone or in groups of three or four at the most. They have usually some garden ground attached, and at Chase Side there is also an open public green. There is therefore, as a rule, plenty of space to each house. Several new estates have lately been laid out for building purposes in this portion of the district. The New River runs from north to south through Central Enfield, in a course originally very tortuous, but which has been straightened by the construction of channels cutting off the bends. One of the old bends running through Chase Side, remains in use as a storage reservoir. The water supply is furnished by the Local Board from a high level reservoir on the Ridgeway. The water is pumped from an Artesian well at Ponders End; it is only turned on for the use of the inhabitants during four hours in each day. A few of the inhabitants get their water from wells, or dip it from the New River, and one newly constructed street has a distinct water service laid on by a conduit from a spring. The removal of excrement is very generally effected by means of waterclosets, though there are some cesspit privies. With the exception of a few outlying places the whole of Central Enfield is sewered; the sewage is collected into a trunk-sewer which delivers it by gravitation upon the Local Board's farm at Cuckoo Hall near Ponders End.

III. The third portion of the district, which may be called Eastern Enfield, is also populous; it is separated from Central Enfield by a belt, about a mile in width, of open country, mostly market gardens. This portion of the district is flat and but slightly elevated above the River Lea, some streets being liable to be flooded. The sub-soil consists of river gravel, with patches of brick-earth in places, and with a belt of alluvial marsh land near the Lea. The most populous part consists of a collection of houses lying along the side of the high-road from London to Hertford, the southern portion being known as Ponders End, the northern, separated by a break of about $\frac{1}{4}$ mile, as Enfield Highway. There are also some streets lying on the east of the main road, as South Street and Alma Road at Ponders End, and Lock Lane leading from Enfield Highway to the Ordnance factory.

The ecclesiastical district of St. James, Enfield Highway, which may be taken as co-extensive with the part of Enfield of which we are now speaking, contained in 1871 8,027 inhabitants, or exactly one-half of the population of the parish. The inhabitants are almost wholly of the labouring class, and find employment in the local factories. Besides the Government Small-arms Factory, there are a jute factory, a crape factory, and a floor-cloth factory, all of which employ a large number of hands, including many women. A good deal of building has gone on of late years. The newer cottages are mostly in continuous rows, but with more or less back space, and there is no great crowding together of houses on the ground. Sub-letting of one or more rooms is very general, and overcrowding is frequent. This part of the district is drained into a low-level sewer, the outfall of which is into a tank at the Local Board's sewage farm, whence at certain hours of the day the sewage is pumped up and distributed over the land. The public water supply is from an Artesian well, the same from which the high-level service is supplied. The water is pumped up into a low-level reservoir, and is turned on for the use of the inhabitants from 6 a.m. to 6 p.m. In Ponders End the use of the Local Board's water is general, but at Enfield Highway, although the water-mains are laid down, few, if any, of the inhabitants make use of the water. Shallow wells with pumps are the general source of supply in the latter place, but one street, Medcalf Road, is supplied from a private Artesian well. Waterclosets are in general use, but there are some cesspit privies, especially at Enfield Highway.

Vital Statistics.—The figures in the following table are taken from the Registrar-General's Quarterly Returns, but with the addition of the deaths

of persons belonging to Enfield dying in the Union Infirmary at Edmonton.* The population is assumed to have increased at the rate which prevailed between 1861 and 1871.

Year.	Estimated population.	Births.		Deaths.		Deaths under one year old.		Deaths from							
		Number.	Rate per 1,000 population.	Number.	Rate per 1,000 population.	Number.	Proportion to 100 births.	Small-pox.	Measles.	Scarlet-fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Violence.
1870	15,648	499	31·9	383	24·5	56	11·2	10	1	102	—	3	9	22	—
1871	16,054	569	35·5	258	16·1	52	9·2	14	4	8	—	—	6	12	2
1872	16,471	557	33·8	249	15·1	63	11·3	10	—	2	2	4	1	22	1
1873	16,893	550	32·5	255	15·1	79	14·4	—	—	1	1	6	5	32	4
1874	17,337	534	30·9	220	12·7	47	8·8	—	1	—	2	—	5	11	2
1875	17,787	569	32·0	314	17·7	94	16·5	—	—	7	7	16	10	20	7
1876	18,249	580	31·8	285	15·6	70	12·1	—	14	3	2	2	12	15	3
1877	18,723	591	31·6	277	14·8	62	10·5	4	4	3	1	—	7	10	8
1878	19,209	560	29·2	344	17·9	82	14·7	1	1	24	12	2	11	16	3
1879	19,708	611	31·1	318	16·2	83	13·6	—	8	5	5	—	8	9	2
Average	17,608	562	32·0	290	16·5	69	12·2	0·22	0·19	0·88	0·18	0·19	0·42	0·96	0·18
England and Wales.	—	—	35·7	—	21·7	—	15·0	0·26	0·36	0·80	0·12	0·51	0·54	0·89	0·74
Standard Rural Districts.†	—	—	30·5	—	14·9	—	10·3	0·06	0·22	0·44	0·18	0·35	0·28	0·49	0·47

Rates per 1,000 population per annum.

From the foregoing table it will be seen that the death-rate in the Enfield district is low, being considerably below the average of England and Wales, and approaching that of the standard rural districts. Nor is there in the nature of the district any reason why it should not rank among the healthiest, for although urban in name, and with the administrative advantages of an urban district, it is in great degree rural in character, having in 1871 an average of more than three-quarters of an acre of land to each inhabitant. The death-rates from the several epidemic diseases are also in most cases below the average for England and Wales, the exceptions being scarlet-fever, diphtheria, and diarrhœa, which are somewhat above the average. In the case of scarlet-fever this excess is due to an extensive prevalence of the disease in 1870.

The grounds on which the present inspection was ordered were the occurrence in recent quarters, as shown in the Registrar-General's Returns, of a number of deaths from "fever," respecting the origin of which satisfactory information was not forthcoming from local sources. Complaints had also been made to the Local Government Board from time to time by residents in the district, of outbreaks of fever therein, and of unsatisfactory sanitary administration by the local authority.

The inspection was made in May and June 1880.

Enteric fever.—It may appear at first sight that as regards the prevalence of continued fevers, Enfield occupies a satisfactory position, the average death-rate from "fever" during the past ten years having been considerably below that for England and Wales. On a closer investigation, however, it is

* The schools of the Edmonton Union are situated at Enfield, but it does not seem necessary to make any allowance for the deaths in them of children from other parishes, as the number of such deaths is small, and the inmates of the schools are presumably not brought there on account of sickness. The Enfield Cottage Hospital receives patients only from Enfield.

† The "Standard group of rural districts," comprises the registration districts of Epsom, Hambleton, Dorking, Reigate, and Godstone in Surrey, and Bromley in Kent. The population of this group of districts was 132,964 in 1871, and is assumed to have subsequently increased at the same rate of increase which prevailed between 1861 and 1871. In calculating the death-rate, the deaths of inmates of the Metropolitan Asylums situated in certain of those districts have been deducted.

found that the aspect is less favourable. If we divide the period 1870–79 into two periods of five years each, we find that while the “fever” death-rate in England and Wales fell from 0·66 per 1,000 per annum in 1870–74, to 0·42 in 1875–79, that in the Enfield district for the same periods, on the other hand, rose from 0·32 to 0·51. Thus while in the kingdom at large the general progress of sanitary improvement has been accompanied by a steady progressive diminution in the mortality from fever (from 0·80 per 1,000 in 1870 to 0·30 in 1879), in Enfield on the other hand the proportional fever mortality has increased so that from being less than half that in the kingdom generally it now exceeds it. Furthermore local enquiries disclosed that the fatal cases formed but a small proportion of the whole number that have occurred. Upwards of 260 cases described as “typhoid,” “gastric,” or “slow fever,” were heard of in the course of the inspection, as having occurred within the last five years, and there have no doubt been many others which were not heard of. Indeed in some streets there had been cases of typhoid fever at some time or other within the past few years in a considerable proportion of the houses.

The number of deaths registered as from “fever” during each quarter of the five years 1875–79 is given in the following table.

Year.	For Quarters ending				Total.
	March.	June.	Sept.	Dec.	
1875	3	2	—	5	10
1876	9	—	1	2	12
1877	1	2	—	4	7
1878	2	2	3	4	11
1879	—	3	—	5	8

As regards its nature, the fever has probably been in almost all instances enteric. Of the above 48 fatal cases, 33 were certified as “typhoid” or “enteric fever.” Twelve cases in 1875 and 1876 were returned as “gastric fever;” being certified by one medical practitioner who left the district in 1877. Two cases which occurred in one family in 1877 were registered as “typhus,” on the verdict of a coroner’s jury, who attributed the disease to the drinking of impure water.

No deaths from fever had been registered in the Enfield sub-district in 1880 up to the date of inspection in May, nor did any recent cases come under observation.

As regards the distribution of the fever through the several seasons of the year, it appears that it has been most prevalent in the two winter quarters, the third quarter of the year being comparatively free.

As regards its incidence in the different parts of the district, it is to be remarked that no part has been wholly free from fever, deaths having occurred in Eastern Enfield, including Ponders End and Enfield Highway, in Central Enfield, including Enfield Town, Baker Street, and Chase Side, and in the outlying places to the north and west. The prevalence of fever has however been greatest in Eastern Enfield; of the 48 deaths in 1875–79, 32 occurred in Eastern Enfield and 16 in Central and Western Enfield, equivalent to an annual mortality—the populations being about equal—of 0·68 per 1,000 in Eastern Enfield and 0·34, or one half the former, in the remainder of the district. Local enquiry tended also to show that the non-fatal cases were more numerous in Eastern Enfield than in the remainder of the district.

As regards the causes of the fever, the sanitary circumstances of the several portions of the district in which the disease has occurred are so dissimilar as to exclude the idea of uniformity in the mode of its production. Looking upon the fever as enteric, we may assume that its causes are to be sought for in the first place in contaminations of air and water supply, affording means by which the specific poison of the disease may be conveyed from case to case. The inspection brought to light the existence throughout the district of numerous sanitary defects such as to render the occurrence

of such contaminations of air and water supply in some cases a matter of certainty, in others of greater or less probability. Thus many of the houses in which fever has occurred were found to be in direct communication with the sewers so as to allow of the entrance into them of sewer air in a concentrated state. In other cases the inmates were exposed to effluvia from foul privies, ill-kept waterclosets, or filthy ditches. The water supply in parts of the district is derived from shallow wells in close proximity to privies, and in those parts where a public water supply has been provided the arrangements for the flushing of waterclosets are in many instances such that there is a danger of foul matters being sucked into the pipes during the daily intermissions of the service.

These potential causes are not equally operative in all parts of the district. Generally speaking it may be said, that the entry of foul air from the sewers into the houses is the most frequent, occurring in all parts of the district, but prevailing especially in Ponders End, where periodic stagnation occurs in the unventilated sewers; that cesspit privies and polluted wells are met with especially at Enfield Highway and the outlying parts of the district; and that the risk of contamination of the water service by reflux is greatest in Central Enfield, supplied as it is by the high-level service, in which the intermissions last during the greater part of the 24 hours.

As regards other possible causes, there is little to be said. Enquiries were made as to the milk supply where several cases were simultaneously attacked, but without finding any special incidence of fever upon persons using milk from one source. In a few instances fever was contracted by persons who had nursed other cases, and in a few others by children attending school, in the latter probably through the medium of defective closets, or polluted water. It was stated that at all the schools children were forbidden to attend from houses in which infectious sickness existed.

The conditions of drainage, water supply, and excrement disposal in Enfield favouring the propagation of enteric fever will have to be spoken of in detail.

I. *Sewer air*.—In a large proportion of the houses in the district, and more especially in those built in recent years, the drain inlets provided for getting rid of waste water are situated in the interior of the house. In such cases there is usually a slopstone, the waste pipe from which is carried down direct into the drain without any external air-break, the only barrier to the passage of solid matters into the sewer and of sewer air into the house being a bell-trap at the top of the sink pipe. A water trap alone, without disconnexion and proper ventilation of the drain, is at best but an inefficient protection against the entrance of sewer air, for it often happens that the pressure of the air in the sewer is greater than that of the air of the house; this is due on the one hand to the accumulation of sewage, or the evolution of gas, producing an excess of pressure in the sewer, or on the other hand to the abstraction of air by the draught of the fires when doors and windows are shut, causing a diminution of pressure in the house. Under these circumstances the noxious gases from the sewer are liable to pass through the water of the trap, either driven in bubbles, or carried in solution, being absorbed on the side where the pressure is the greater and given off again on that where it is the less. The smaller the volume and depth of trapping water, the more likely is this to happen. These objections apply with greater or less force to all traps used as the sole barrier against the entrance of sewer air into the house; but there are other strong objections which apply specially to the bell-trap. Indeed the worthlessness of this form of trap is so generally admitted that it would be unnecessary to say a word in its condemnation but for the fact that its use in the Enfield district is well nigh universal, a large size being commonly used for yard gullies. Habit, and a trifling saving in original outlay at the cost of safety, convenience and durability, are apparently the only reasons which can be adduced for its use.

The bell-trap consists of two separate parts, 1st, an annular cup surrounding the top of the sink pipe, and capable of containing, in the smallest sizes, not more than two or three ounces of water, and 2nd, of a loose grating to the under side of which is attached, usually by a narrow

neck, an inverted cup or bell, which when in place covers the aperture of the pipe, and dips at its circumference into the water contained in the annular cup.

The special objections to this form of trap are as follows :—

1st. The grating and bell being loose can be easily taken up, and then there is no trap at all. This is commonly done to allow the waste water to escape more quickly, the waterway of the trap being very narrow. The trap in cheaply built houses is commonly made of cast iron, upon the rough surface of which grease and dirt are deposited which soon clog it up. It is also very readily choked, and then the bell must be taken up to clear it. Careless people take up the bell to allow solid matters, as tea leaves, to go down the drains. Whenever the bell is out of place a current of sewer air streams up into the house. Moreover, being loose, the bell is liable to be lost altogether.

2nd. The amount of water which the trap contains is very small, and the depth of water seal very trifling, in the small sizes commonly from $\frac{1}{4}$ to $\frac{1}{2}$ an inch; hence the trap when intact and in place offers but a very feeble barrier to the entrance of sewer air. In several instances complaints were made that even when the bell was in place bad smells came up from the sink, and this although the trap was uninjured, and there were no apertures through which the sewer gases could pass otherwise than through the water.

3rd. The bell-trap is exceedingly liable to malformations and injuries of various kinds, all having the effect of establishing a direct communication between the air of the drain and that on the other side of the trap. Of these many examples were met with in the course of the inspection, frequently associated with the occurrence of fever in the house.

What is called a "mason's trap," built of brickwork and slates, is used in some cases. This kind of trap is often too large, retaining a considerable quantity of putrescent sediment, and it is very liable to be rendered useless through defects of workmanship, *e.g.* leakages, allowing the water to escape and the trap thus to become unsealed, or crevices above the midfeather through which the sewer air can come up.

In some few instances the sink-pipe had never been trapped at all. In comparatively few cases was it disconnected from the drain by an air break, and even in some cases in which this treatment had been attempted, it had been so imperfectly carried out that little or no advantage resulted from it, the sink-pipe ending, not in the open air, but in the body of a roughly made and defective trap.

In very many of the houses in which fever had occurred complaints were made by the inmates of the bad odours arising from inefficiently trapped sinks; in some cases also outside gullies in the immediate neighbourhood of the houses were complained of as sources of nuisance. Complaints were also made in some instances of bad smells arising from beneath the floors, and of the house being infested with rats, indicating the probable existence, under the floor, of a communication with the drain. At one house in which fever had occurred a nuisance arose from the soil-pipe of a neighbour's watercloset, which was fixed against the outer face of the wall in a narrow corner close to the back door. The soil-pipe was unventilated, and had open joints, through which sewer air escaped.

The branch drains are as a rule kept outside the houses, but occasionally they have had to be taken underneath them.

Although sinks with bell-traps are found in all parts of the district, yet it was at Ponders End that complaints of nuisance arising from them were most commonly met with, and it is there also that the greatest prevalence of fever has occurred. In Alma Road, Ponders End, a comparatively new street, containing about 70 houses, inhabited by the working class, fever has occurred in every year since 1875; there have been at least 54 cases, occurring in 29 households, and with 8 deaths, *viz.*, three in 1875, four in 1876, and one in 1879. There have also been many cases in South Street, an adjoining street.

The explanation of the special incidence of fever in these streets seems to be that not only are the houses very generally in direct communication through the sink pipe with the sewers, but that owing to the periodical variations of volume of the sewage, and to the absence of ventilation of the sewers, the foul air from them, often specifically infected, is more liable here than elsewhere to be forced into the houses.

The main low-level sewer, in the lower part of its course, runs along Alma Road; it is an 18 inch brick culvert, with a fall of 4 feet to the mile, and is stated to be free from sediment. The outfall is into a tank from which the sewage is pumped up day by day and distributed over the sewage farm: in the intervals of pumping the sewage collects in the tank. The Surveyor states "We pump upon an average seven hours per day. There is no sewage "penned back in the low-level sewer towards the Alma Road, our tanks "being of sufficient capacity for the night flow; but should there arise any "influx of water at any time, it is carried off by a storm overflow, especially "provided for that purpose." In a subsequent communication, however, he states that the invert of the inlet pipe into the storage tank of the low-level system is three feet below the storm overflow; if so the sewage will cover the crown of the inlet before the overflow can come into operation. It must be remembered too that the low grounds are liable to floods, which will impede the discharge of sewage at the time when its volume is the greatest. Although the surface water is intended to be excluded from the sewers, some will find its way in from yard gullies, and there is also much soakage into the sewer from the subsoil. The flow of sewage will also largely depend upon the amount of water consumed or running to waste. Taking these things into consideration it cannot be doubted that in the lower part of the low-level sewer frequent variations in the volume of liquid must occur to a greater or less extent, displacing the air of the sewer and branch drains, and forcing it out wherever it can make an exit.

Under these circumstances it is important to inquire what are the provisions for ventilating the sewer. Between the outfall tank and South Street, Ponders End, a distance of three furlongs, there is no ventilator at all. The first ventilator as we proceed up the sewer is a manhole in the roadway in South Street; in this there is a charcoal basket, the charcoal in which is said not to have been changed since it was first inserted some six years ago. No sewage smell was perceived issuing from this manhole, and probably no ventilation of the sewer is effected by it. The next ventilator on the main sewer is at the north of Ponders End, the interval between it and the South Street manhole being as great as that between South Street and the outfall; this ventilator seems to be efficient. There are a few ventilating manholes on the branches of the low-level sewers at Ponders End and Enfield Highway. The high-level sewerage has a better fall, and the outfall is continually open; there are no special ventilators, but a certain amount of ventilation is afforded by the rainwater stacks of some of the houses. It is however desired to exclude as much surface water as possible from the sewers, and consequently the street gullies and rainwater stacks are not as a rule connected with the sewers.

The sewers as a rule are said not to require flushing; their fall being for the most part sufficient to keep them clean, but certain branch sewers are occasionally flushed with a hose pipe through the manholes.

Complaints were made by persons residing near the sewage farm of the stench arising from it. The nearest houses, however, with the exception of those on the farm, in which there had been no enteric fever, are from a quarter to half a mile distant. The volume of sewage being larger than can be utilised by irrigation in the ordinary course of sewage farming, it is partly dealt with by what are called filter beds. These are portions of land under-drained and enclosed by embankments, on which the sewage is run to a depth of two or three feet, and allowed to stand until the liquid part has evaporated or soaked away, leaving a thick layer of sediment on the surface. These pools of stagnant sewage must be more liable to occasion nuisance than irrigated fields.

Several cases of enteric fever have occurred in houses in close proximity to a ditch which runs at the back of Parsonage Lane and Love's Row, Chase Side. This ditch, although not supposed to be used as a sewer, receives house slops and the leakings from cesspit privies, and is in a foul and offensive state.

II. *Public water supply.*—The public water supply of Enfield is derived from an Artesian well at Alma Road, Ponders End. The well is sunk into the

chalk, and is bored to a depth of 360 feet; the water rises to about 10 feet from the surface, but is lowered about 6 feet by each day's pumping. The well is said to be cased in water-tight tubing, but there is a strong influx of water into it from a side opening near the top; this is said to come from the surface bed of gravel, which becomes filled with water during the night by the overflow of the well, thus acting as a storage reservoir. As there are houses on both sides of the waterworks and the main sewer runs at a distance of only 50 yards, it cannot be considered very safe to draw water for public use from this superficial gravel. Analyses of the water at its source are said, however, to have yielded favourable results, and it would appear that the purity of the public water service is exposed to more danger in its ultimate ramifications than at its origin.

There are two separate services, a high-level and a low-level, both supplied from the same well. In the low-level service which supplies Ponders End, the water is on from 6 a.m. to 6 p.m.; in the high-level service by which Central Enfield is supplied, the water is turned on to each place for only four hours in the day: the hours differ in different sections, and some places which have their supply in the early morning have the water turned on again for a quarter of an hour in the afternoon. Although the supply is thus intermittent, cisterns for storage of the water are the exception rather than the rule, at least in the smaller class of houses. For household use water has to be stored in buckets during the intermissions. Where there are no cisterns the water-closets are flushed direct from the service pipes by means of screw-down taps, or water has to be poured down them by hand, or in a few instances the sink pipe is led into the watercloset pan. Where cisterns exist, the same cistern in almost every case serves for the supply of water for household use and for flushing the closet. The supply of water to the closets is in almost all cases very insufficient; even where there is a cistern, the flushing pipe is usually so small (a $\frac{1}{2}$ -inch lead pipe) that it does not deliver water in a stream sufficiently forcible, and the apparatus was in many cases found out of order. The stream from a screw-down tap is also much too weak to flush the closet properly, and hence it is a frequent practice to leave the taps open. In some of the closets the screw-down taps are fitted with a so-called water-waste preventer. This is a cylinder under the seat, containing a ball which gradually rises when the tap is turned, and cuts off the stream when a certain quantity of water has run. When the tap is again shut the ball falls back. The water-waste preventers are frequently out of order; and it is said that the ball is often removed. They do not augment the flushing power of the stream, and it does not seem certain that they would prevent reflux into the pipes. Of course it is only during a portion of the day that any water at all will run.

The result of the insufficiency of the arrangements for flushing is that the interiors of the watercloset pans are commonly in a very foul state and smeared with filth, and that stoppages are not unfrequent. In one case a watercloset was found stopped up, the pan standing full of excrement and water above the level of entrance of the flushing pipe. It is evident that should any back draught into the water pipes take place, it would be very likely that effluvia from the closets or even foul matters in the solid and liquid form, would be sucked into the water service. It is certain that an in-draught of air into the water pipes is of frequent occurrence, and it is probable, although I did not succeed in actually demonstrating it, that the entry of the air is sometimes effected by way of the watercloset taps.

When the supply has been shut off in a particular main a certain quantity of water can still be obtained from the taps at the lowest level; thus although the supply to Ponders End is shut off at 6 p.m. it is stated that water can sometimes be obtained from the lowest taps up to 10 p.m., being drawn from the upper parts of the system. To supply the place of the water thus drawn out air will necessarily rush in through any tap which may chance to be left open. On one occasion during the inspection, on opening the tap of a standpipe at a time when the water was turned off, a rush of air into the pipe was heard, and the finger placed over the orifice of the tap was pressed against it by the external air. It very frequently happens that when a tap is first opened after an intermission a loud rush of air from the pipe takes

place before any water comes. The first drawn water has also been noticed in some cases to be milky from admixture with fine bubbles of air. Reflux of air into the pipes is indeed less liable to take place at the waterclosets than at the house taps, since on the same premises the level of the former is usually below that of the latter; exceptions to this rule, however, were noticed, and of course the watercloset of one house may be on a higher level than the tap of another house on a lower site. In some cases the house supply is drawn from a tap fixed against the watercloset, the branch pipe coming off close to the seat, and the mouth of the tap being on a lower level than the orifice of the flushing pipe. It commonly happens that when a house tap is opened the stream from the watercloset tap greatly diminishes or ceases; and it is probable that under certain circumstances the current may even be reversed, and water be drawn from the watercloset pipe towards the main. It may at first sight be supposed that even if this were the case any matters drawn into the pipes through an open tap would be expelled by the same route as soon as the pressure in the mains was restored. If, however, such matters had been drawn into the pipes sufficiently far to pass the junction of a pipe supplying a house tap, there would be no certainty which branch they might take on their return journey. It is not attempted to show more than that contamination of the water service by this means may, and probably does occasionally occur. I am not prepared to affirm how frequently such pollution of water has taken place, nor what proportion of the fever may be attributable to this source. It very commonly happens that the first water drawn after an intermission is turbid, depositing a brown flocculent sediment. Examination of two samples of this sediment showed it to consist mainly of hydrated oxide of iron, entangled among the filaments of an alga (a small species of *Oscillatoria*); it also contained grains of sand, black carbonaceous matter, filaments of hemp or some similar vegetable fibre (some dyed), monads, and a few large ciliated infusoria. It blackened on ignition. The presence of this sediment in the first drawn portions of water is no doubt due to its being stirred up and carried forward by the forcible rush of water into the empty pipes. The oxide of iron may be derived from the precipitation of that contained in the water at its source (the water of other Artesian wells in the district deposits a rusty sediment) or from the oxidation of the interior of the iron service pipes; such oxidation would be especially liable to take place in pipes filled at one time with air and at another with water. In a single instance complaint was made that the water first drawn in the morning had sometimes a disagreeable smell. In several instances the statement was made that the persons attacked with fever were great water drinkers, or that they were in the habit of drinking water the first thing in the morning.

The danger of reflux of foul matters into the water pipes is obviously greater in the high-level service where the pipes are only charged for 4 hours out of the 24, than in the low-level service in which they are kept charged for 12 hours, and during that part of the day when water is most required. The cases of fever in which in the absence of other apparent cause it seemed probable that the origin of the disease was to be attributed to local contaminations of the public water supply, occurred mostly in Central Enfield, *i.e.*, that part of the district supplied by the high-level service.

An outbreak of enteric fever occurred in Baker Street last autumn, 15 or more cases among members of 10 households, having commenced in Sept.-Nov., 1879, several beginning in the same week. The origin of these nearly simultaneous cases is obscure, except upon the hypothesis that it was due to partial contaminations of the water service occasioned in the manner above described. There had been an obstruction in the sewer, but with one exception all the houses in which fever occurred, were situated below the point at which the obstruction took place, and the lower part of the sewer is stated by the Surveyor to have been clean and in good order. With two exceptions the sinks were either outside the houses, or were trapped with efficient traps, and in only one was complaint made of bad odours from the drains. The milk supply was obtained from several different sources. The water was obtained from the town service, with one exception, in which it was got from a shallow well, probably liable to pollution since when some

paraffin oil had been spilled on the ground near the well, the water smelled and tasted of it. The water-closets were in all cases external, but were flushed by means of screw taps in direct connexion with the water mains, an arrangement under which, in connexion with an intermittent service of water, reflux of foul matters into the pipes is liable to occur. In the course of the inspection a place was noted as affording special facilities for the occurrence of such contamination. At Meeting House Yard in Baker Street are some old cottages, built of lath and plaster. Behind these are two water-closets used in common by the inmates of seven houses, and possibly by passers by in the street. The pans of the closets were found in a filthy state, and the taps running. It was stated that one of the closets was frequently stopped up, standing full of excrement above the entrance of the flushing pipe. The stand pipe which supplies these houses is situated at a lower level than the closets; when the tap is first opened after the water has been turned on, a loud rush of air takes place from it—air which must have been drawn into the mains during the intermission. There had been two cases of fever in Meeting House Yard in May 1879, and others occurred there in the outbreak in the autumn.

III. *Contamination of wells.*—Wells, as sources of water supply, are in use in the outlying places in the district to which the watermains do not extend. At Enfield Highway, although there are mains in the streets, the Local Board's water is not made use of, indeed the inhabitants scarcely seem aware that it is within their reach. The owner of some cottages stated that he had been to considerable expense to erect a force-pump for the supply of his property, in ignorance that there was a public supply close at hand. Wells are here in general use, and there are a few houses supplied from similar sources in other places as at Hadley. The wells are, with few exceptions, shallow, sunk in the superficial bed of gravel overlying the London clay. In the places where they are in use cesspit privies are not unfrequent. The cesspits are in some cases very near to the wells, in several instances only two yards distant, and they are not made water-tight. Again, where there are water-closets the drains, owing to the insufficient supply of water, are apt to get blocked up and leak into the subsoil. From these causes the shallow wells are liable to become polluted. The water of some of them was obviously unfit to drink. That of a pump-well at Gilbert Terrace, Enfield Highway, was black and stinking; but it had been drunk up to the time when the children of the house were taken ill of enteric fever last year. In some instances, cases of fever broke out about the same time in several houses supplied with water from the same well, this being so situated as to be liable to contamination.

IV. *Defective arrangements for disposal of excrement.*—Cesspit privies are commonly placed at a distance from the houses, but some instances were found in which they abutted on them, or were in such close proximity as to be a source of nuisance to persons in the house; in others, it was stated that this had formerly been the case, but that after the occurrence of "fever" the privy had been converted into a water-closet.

The following are examples of outbreaks of fever associated with defective privy arrangements, and attributable to contamination either of air or drinking water:—

Eastfield Road, Enfield Highway.—An outbreak of fever occurred in 1878 in four contiguous houses in this street, viz., Nos. 27, 28, 29, and 30. These houses were not then drained into the sewers, but had gullies in the yards connected with the road drains. There was a foul ditch on the other side of the road, since covered in. There were then privies with cesspits abutting on the houses, but these have since been converted into water-closets. The pumps of the four houses are supplied from two shallow wells, one for Nos. 27 and 28, and one for Nos. 29 and 30, each well being only six feet from the sites of the cesspits of the houses which it serves. The parties had all left at the time of inspection, and the dates of commencement of the several cases could not be obtained, but it was ascertained that the first case was a man living in No. 28, who worked at the Ordnance Factory; that the next

was a woman at No. 27, who died. The case at No. 30 occurred subsequently, and was a woman who had nursed the patient at No. 27.

Grove Road, Lock Lane.—Cases of fever have occurred from time to time in this road and its vicinity; 13 were heard of. The inhabitants are of a poor class, and frequently change their abode. The drainage of this street is very defective and there are cesspit privies of a very offensive description. The privies belonging to the houses on the north side of the road abut on the sculleries, and when they are full, the ordure is said to well up from the floor into the houses. The water supply is derived from shallow wells, obviously polluted; in some cases situated at a distance of not more than 6 feet from cesspit privies. The supply is also deficient in quantity, there being only 4 pumps for 59 houses, but for cleaning purposes it is supplemented by the water of an adjoining brook.

A common position for the water-closet in the newer cottages is abutting on the scullery at the back of the house, but approached from the outside. In some cases a bedroom projects over it, and the cistern above the closet is accessible by taking up the loose boards of the bedroom floor. As the soil-pipe is not ventilated, and the flush of water is not sufficient to keep the pan clean, offensive effluvia arise from the closet and pass through the interstices of the floor into the bedroom above. They must also be liable to be absorbed by the water in the cistern, which is used for drinking as well as for flushing purposes. In the houses of a superior class the water-closet is usually inside. The soil-pipe is rarely or never ventilated.

In two instances the propagation of fever when introduced appeared to be effected by the means of badly managed "earth-closets," so called. In some cases the Enfield Local Board have sanctioned the use, according to Section 37 of the Public Health Act, 1875, of earth-closets in lieu of water-closets, and this in the situation which has been mentioned as the usual one for water-closets, viz., at the end of the scullery. The supply of dry earth and the removal of excrement has, however, been left to the occupier, although the premises do not afford facilities either for obtaining the one or disposing of the other. In consequence, earth is not used, or at most fine ashes, an inferior substitute, take its place; the cleansing is also apt to be neglected. The result, where a fixed receptacle is used, is a privy distinguished only in name from a midden or cesspit-privy, abutting on the house and commonly giving rise to a serious nuisance. Another difficulty in such cases, where there is no sink except inside the house, is the disposal of chamber-slops, the choice of evils lying between throwing them into the earth-closet, into the scullery sink, upon the surface of the ground, or into the street.

The following is one of the instances referred to:—

In Nag's Head Lane are a pair of semi-detached cottages in an isolated position. In one of these, occupied by a large family, and somewhat overcrowded, 5 cases of enteric fever occurred in 1879; in the other occupied only by a married couple of mature years, there were none. The first case, a girl of five, began to be ill on July 4th 1879; she had been attending the National School, London Road. Some other cases of enteric fever occurred among children attending this school, at which the trough closets were found in a bad condition. The second case, a girl of 12, was attacked two or three weeks after the first; the mother, who had nursed her children, fell ill soon after, and two others in the course of the autumn. These cottages are not connected with the sewers, but are drained by pipes into a ditch on the other side of a neighbouring field. Water is dipped direct from the New River which runs close by. At the cottage in which the fever occurred the closet abuts on the pantry, from which it is separated only by a partition, partly of board, and partly of lath and plaster. It was constructed as an earth-closet with a movable receptacle, but earth is not used in it, so that it is simply a pail-privy. It is said to be emptied two or three times a week. There was formerly a privy with a cesspit, from which a bad smell used to come through the partition into the house, but this was altered before the fever occurred, and no smell from the closet is now complained of. Carbolic powder is said to have been sprinkled about the house from the

first, but not to have been used with the excreta until after the first three cases were attacked.

In not a few households, the first cases of fever were children attending public day schools, suggesting that the fever had been contracted either at school or on the way thither. The conveniences provided for the use of the children at the day-schools are either trough-closets or water-closets of the ordinary kind. They were found at several of the schools in a very foul state. The cleanly keeping of such places is a point which should receive the attention of school managers, both for the sake of the health of the children at the time present, and also to inculcate habits of cleanliness and care, which will be of good service to them through their future lives.

Almost all the houses in which fever was known to have occurred were visited in the course of the inspection, but it would take too long to describe the circumstances found in each case; nor is it necessary in this report to give local details of nuisances such as should be furnished to the Sanitary Authority by their own officers. Suffice it to say that in almost all cases unwholesome local conditions, coming under one or more of the preceding categories, were found, such as the Sanitary Authority might have taken steps for the removal of as nuisances injurious to health. Nor were these conditions confined to the older houses erected before the constitution of the district. Several of the streets in which fever has prevailed are of recent date; indeed the newer cottages are more generally in communication with the sewers than the old ones.

Sanitary administration.—The Enfield Local Board of Health was first formed in October 1850; it consists of 12 members, who meet about once a fortnight.

The Local Board since its formation has carried out systems of sewerage and water-supply, which extend to all the populous parts of the district; and has established a sewage farm for the purification of the sewage before it enters the River Lea.

The amount of money borrowed for permanent works up to March 1879 was 63,645*l*. Since that date the Authority have obtained sanction for the further borrowing of 1,200*l*. for works of water-supply, and 6,320*l*. for purposes of sewerage and sewage disposal, including the construction of new sewers in certain streets, the exclusion of subsoil water from existing sewers, and the provision of additional ventilating shafts.

While the Local Board has been careful to provide its district with sewerage and a public water supply, it will be seen from what has gone before that it has not exercised an equal amount of care in the supervision of the details of the arrangements by which the sewerage and the water service are made available for the use of the individual houses, but has allowed the connexions with both to be habitually made in such modes as to afford opportunities for the transmission of disease from household to household through the medium of these systems. Furthermore, the Authority have failed to discharge the duty imposed upon them by section 92 of the Public Health Act, to cause inspection of their district to be made from time to time with a view to ascertain what nuisances exist therein calling for abatement; the appointments of the Medical Officer of Health and Inspector of Nuisances being made upon such a footing as to render it vain to expect that this duty can be efficiently performed.

The Medical Officer of Health is appointed without any definite term of office; he has no fixed salary, but is paid by fees when his services are called in by the Authority. His appointment has not been sanctioned by the Local Government Board, under s. 191 (3) of the Public Health Act, 1875, although he is District Medical Officer for the Enfield Highway Poor Law District of the Edmonton Union. It is evident that the mode of remuneration adopted does not provide for the continuous supervision and systematic inspections which are the most important functions of a Medical Officer of Health; and no such systematic inspections are in fact made by him. He presents no annual report, and receives no returns of deaths, nor any information of cases of pauper sickness other than those in his own district.

The office of Inspector of Nuisances is held jointly with that of Road Surveyor; the officer being supposed to devote to the inspection of nuisances

the spare time remaining on his hands after keeping in order 60 miles of roads. No part of his salary is repaid from the Parliamentary grant. The byelaws regulating the duties of the Inspector of Nuisances do not explicitly specify that he shall make systematic inspection of the district, but only prescribe that he shall forthwith deliver to the Surveyor all complaints of nuisances which he may receive from the inhabitants; that he shall inspect all slaughter-houses and shops for the sale of animal food; "and generally that he shall perform all the duties appertaining to the office of Inspector of Nuisances to a Local Board of Health, except where otherwise appointed by the byelaws, or by a special resolution of the Board."

The office of Surveyor is distinct from the preceding; the duties as defined by the byelaws comprise: "All matters which concern the original construction, or the alteration in construction, of works under the authority or control of the Board, as also the management of all waterworks, water-courses, sewers, and drains," together with the supervision of the erection of new buildings and of alterations in old ones. The present Surveyor, an able officer, is in the habit of noting any sanitary defects which he may meet with in the course of his visits in the district.

As an example of the failure of the Sanitary Authority not only to exercise effective supervision over the construction of new houses, but also to deal effectually with conditions injurious to health, even when brought prominently under their notice, the following case may be quoted:

In Lower Gordon Road, Chase Side, at least 13 cases of typhoid fever occurred between December 1877 and March 1879, and the outbreak was the subject of local complaints to the Local Government Board, and of correspondence between the Board and the Sanitary Authority. The houses in which the fever occurred have only been erected about three years. Like many of the cottages in the district they have on the ground floor two living rooms and a scullery, the water-closet adjoining the latter but being approached from the outside; on the upper floor three or four bedrooms. In the present case the back bedrooms project not only over the scullery, but also over the water-closet. The cistern, which supplies water both for flushing the closet and for drinking, is situated above the water-closet, but under the floor of the bedroom, the boards of which are loose and can be taken up to gain access to the cistern. In consequence of this arrangement effluvia arising from the closet can pass freely upwards into the bedroom, tainting on their way the water in the cistern, which is also liable to be contaminated by dirty water or dust dropping through the crevices of the floor boards, whenever the floor is washed or swept. The sewer in this street is very flat, the surface of the ground being lowest at the end of the street farthest from the main sewer. The drain of the houses at that end of the street, for want of sufficient fall, is obliged to be laid partly above the ground; it is choked with sediment, and sewage oozes up in the backyard of one house and through the scullery floor of others. There is a foul pond at the end of the street, a source of danger to life from the insecure and unfenced state of its banks, as well as of nuisance.

The state of things above described, as regards drains, water-closets, and cisterns, is almost identical with that noted by the Rev. S. King, curate of Enfield, in December 1878, in a communication to the Local Government Board. Yet on January 17th 1879 the clerk to the Enfield Local Board wrote, "I am desired by this Board to state that they have this day received from their surveyor a report to the effect that all the work suggested by Mr. King had either been, or is in course of being, carried out. The drains of all the houses have been relaid and put in thorough working order. Zinc coverings are being provided for the water cisterns. The floors of the rooms above the cisterns have been rabbetted with the view of preventing dirt or dust finding its way through the boarding, and the ceilings of the water-closets will be completed as soon as the weather permits." Not one of the things stated by the late Surveyor to have been carried out has been performed effectually. It is stated by the tenants that something was done to the drains, but at the time of inspection as aforesaid they were again blocked, the sewage leaking from them, both inside and outside the houses. Sheets of zinc have been placed on the cisterns, but they are not wide enough to cover them, and dirty water coming through the floor can drop from

the edges of the zinc into the water. The boards over the cisterns were loose, and did not appear to have been ever rabbetted. The water-closets had been ceiled, but, except in one case, a large hole had been left in each ceiling through which the effluvia from the closet could find their way into the bedroom as before. In the exception the hole had been subsequently plastered up by the tenant.

The supervision of the erection of new buildings receives due attention at the hands of the present Surveyor, but has formerly been very laxly carried out. The following is another instance of the way in which, owing to the lack of proper supervision, new buildings have been allowed to be erected containing most unwholesome arrangements, which the provisions of the existing byelaws would apparently have been sufficient to have obviated.

The "Model Dwellings" are a newly erected building containing 12 tenements in three flats, four on each flat. Each tenement contains three rooms, one in front, one at the back, and one in the middle. The middle rooms, which are used as children's bedrooms, are in most of the houses without external light or ventilation, being lighted only by openings in the partitions between the middle and the front and back rooms. Yet one of the byelaws requires that every habitable room shall have at least one window, which shall be at least $\frac{1}{10}$ of the area of the room. Again, the three closets which in each wing stand one above the other discharge into the same soil-pipe, which is unventilated, so that when the contents of one closet are discharged the falling water must tend to force the foul air of the soil-pipe through the traps of the closets below, or to suck out the water from the traps of those above. Some of these closets are in direct connexion with the interior of the houses; and in one there was an odour of sewer air so strong as to be quite overpowering. The byelaw which requires that proper ventilation shall be provided in the drainage of every house had not been carried out. Three cases of enteric fever occurred in these dwellings in the summer of 1879.

The powers for the regulation of new buildings possessed by the Sanitary Authority under the byelaws now in force, which were made in 1865, are found inadequate in a district where so many new houses of a cheap class are continually being erected. The Sanitary Authority seem to find need of increased powers among others in the following directions, viz., to enable them to require that the mortar with which houses are built shall be composed of proper materials; that the level of the ground-floor of new houses shall bear a suitable relation to the level of the ground outside; that there shall be complete disconnexion between drains and the interior of houses; and that service-cisterns shall be provided for flushing water-closets. A new code of byelaws, based upon the model byelaws has been adopted by the Sanitary Authority and has been promised confirmation by the Local Government Board.

The Sanitary Authority do not undertake the emptying of privies and cesspools, but have a covered waggon which they lend for the purpose, the work being done at the cost of the owners of property. Privies and cesspools exist mostly in outlying places, where they are at a distance from the houses. In the more populous parts they are being gradually abolished, and water-closets, connected with the sewers, substituted. The Local Board have a staff of workmen by whom, when so desired, sanitary work is executed.

There are no public arrangements for the removal of house refuse. It is stated that there is no need for the Sanitary Authority to undertake this work as there is a great demand for house refuse at the brickyards; the brickmakers sending round their carts two or three times a week to collect it, and sometimes even paying a trifle for it to the occupiers. Few cases were met with during the inspection in which there were accumulations of house refuse to any notable extent. The absence of a proper receptacle, fixed or movable, for ashes and refuse, is, however, very general; waste matters, for want of such a convenience, being frequently littered about all over the backyards.

Overcrowding is frequent in the district, and no attempt appears to be made to abate it. There is in the district but one common lodging-house, situate at Mill Corner, Hadley; it is kept in a cleanly state.

The Sanitary Authority have no hospital for the isolation of cases of infectious sickness. There is, however, a cottage hospital at Enfield into

which cases of enteric fever are admitted; 10 cases of that disease were treated there in 1879, 5 in 1878, 2 in 1877, and 1 in 1876. There are wards for infectious diseases at the Edmonton Union Workhouse, into which pauper cases from Enfield are taken.

Carbolic powder and Condyl's Fluid, are furnished in some cases at the cost of the Authority to households in which fever has occurred, but the houses are not fumigated nor lime-washed. There is no apparatus for disinfecting clothing and bedding by heat.

Taking into consideration the influx of population of the working class, and the resulting erection of large numbers of houses of a cheap class over the construction of which no effective supervision has been exercised to secure the requirements of healthy living, in a district where systematic inspection for the detection and removal of conditions inimical to health has been practically in abeyance, the increased prevalence of fever in Enfield during the past few years in spite of the public works that have been carried out, is no matter for surprise.

Local Government Board,
October 1880.

H. FRANKLIN PARSONS.

Recommendations.

1. Efficient sewerage should be provided for all populous places in the district. Measures should be taken to prevent nuisances arising from sewage finding its way into old drains, ponds, and ditches.

2. The sewers should be properly ventilated by shafts or openings at intervals sufficiently frequent and in proper situations, care being taken that these openings are kept clear and unobstructed, so as to afford a free passage for air.

3. Care should be taken that in the disposal of sewage, no nuisance be created.

4. No direct communication should be permitted between the drains and the interior of houses, except in the case of water-closets, the soil-pipes of which should be properly ventilated. All other pipes for the discharge of waste water should terminate in the open air. The house drains should be disconnected from the sewer and ventilated on the principles set forth in the Model Byelaws. Traps, where traps are required, should be of such kinds as contain a water-seal of not less than two inches in depth, can be readily cleansed without being unsealed, and are not easily liable to get out of order.

5. All water-closets should be provided with external ventilation, and with an adequate supply of water for flushing, by means of a service cistern or similar appliance, the flushing pipe being of such construction and dimensions as to allow of the passage of water in a stream of sufficient force for the removal of excreta and the cleansing of the pan. No connexion should be permitted between any pipe or cistern containing water for drinking and any water-closet, except by means of such service cistern.

6. Privies with leaky cesspits, and all privies that by construction or position are a nuisance, should be done away with, and water-closets or other improved appliances substituted. The Sanitary Authority should see that all water-closets, earth-closets, and privies are so kept as not to be a nuisance or injurious to health, and more especially should put in force the powers which they possess under Section 47, Clause 3, of the Public Health Act, 1875, against any person who in an urban district allows the contents of any privy, water-closet, or cesspool to overflow or soak therefrom.

7. In view of the dangers and inconvenience resulting from the intermittent nature of the water supply, the Authority should consider whether it would not be advisable and practicable to furnish their district with water laid on at a constant pressure, due precautions being taken against unnecessary waste by inspection and by requiring the provision of proper fittings. If it be found impracticable to afford a constant supply, they should endeavour

to procure the provision of cisterns for storage of water during the time that none can be procured from the mains. Means should be provided for the free entrance of pure air into the mains during the intermissions.

8. All houses in the district which are without a sufficient and wholesome supply of water, should be provided with one. All wells of doubtful purity should be examined, and if found to be polluted should be closed, a pure supply being substituted.

9. Each house in the district should be furnished with a proper receptacle for ashes and dry refuse, which may conveniently be moveable in cases in which the removal has to be effected by carrying it through the house. The Authority, if they do not themselves undertake or contract for the removal of such matters, should see that no nuisance results from their accumulation.

10. The abatement of nuisances, among which overcrowding may be especially mentioned, should engage the earnest attention of the Sanitary Authority. The first step to this end will be to make arrangements for bringing the whole of the district under regular inspection. The appointment of Inspector of Nuisances should, therefore, be placed on such a footing as will enable the officer to devote a sufficient amount of time to this work.

11. The duties of the Medical Officer of Health should be those set forth in the Local Government Board's General Order of March 12th, 1880. Among these duties may be especially mentioned the systematic inspection of the district, the inquiry into the causes and origin of disease therein, and the preparation of an annual report comprising a summary of sanitary action taken during the year and an account of the sanitary state of the district generally at the end of the year.

12. The Medical Officer of Health should be furnished with returns of all deaths occurring within the district, and with immediate notice of deaths from infectious diseases.

13. Houses in which sickness of an infectious nature occurs should be visited, and the occupants advised as to the measures proper to be taken for arresting the spreading of the disease. When the sickness is over the house and its contents should be properly disinfected by sulphur fumigation or other effectual method. An oven for the disinfection by heat of infected clothing and bedding would be of value.
